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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/648,725

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Jongyoon Han

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EXAMINER

OLSEN, KAJ K

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

03/17/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/648,725	Applicant(s) HAN ET AL.	
	Examiner KAJ K. OLSEN	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-28,30-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 24-28 and 30-38 is/are allowed.
- 6) ☒ Claim(s) 39-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. The outstanding objection to claim 28 has been withdrawn in view of the amendment.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 39-41 and 44-55 are rejected under 35 U.S.C. 102(e) as being anticipated by Austin et al (USP 5,837,115).

4. These claims remain rejected over the Austin for the reasons set forth in the previous office action. With respect to the new limitations of claims 39, 44, 51, and 53, Austin disclose the addition of nucleic acids to the device and discloses that the use of constricted regions that are substantially equal to the radius of gyration of the molecule being separated. See col. 10, l. 66 - col. 11, l. 9. Because the radius of gyration of a nucleic acid is going to be one-half the equilibrium spherical shape (see fig. 1 and 2 of the instant invention which shows that nucleic acid molecules have a size that is $2R_0$ where R_0 is the radius of gyration), and because one-half would read on the broadest reasonable interpretation of a constricted region having a depth “substantially less than an equilibrium spherical shape”, then Austin still anticipates claims 39

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and 44. With respect to claims 51 and 53, a constricted region that is one-half the equilibrium spherical shape would also read on the defined entropic barrier that would influence the shape of the molecules as they move through the channel in response to a driving force. The examiner notes that he has withdrawn the use of Austin against independent claims 24 and 32 because both of these claims require they require the constricted region have a depth substantially less than a radius of gyration, which Austin teaches away from using.

5. With respect to the various dependent claims, see the discussions from the 7-5-2007 and the 1-17-2007 office actions.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Austin in view of Wilding et al (USP 5,304,487).

8. Austin does not disclose using an optical microscope as a detector, but does disclose using a transparent cover for viewing the molecules (col. 6, ll. 1-3). Wilding discloses a separating device comprising means for optical detection through a transparent cover (col. 8, ll. 1-7) by using a microscope (col. 9, ll. 49-53). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device disclosed by Austin by using a microscope for optical detection as disclosed by Wilding because it useful in

detecting different types of molecules more closely and a transparent cover would allow observation by use of a microscope.

Allowable Subject Matter

9. Claims 24-28, 30-38 are allowed.

Response to Arguments

10. Applicant's arguments filed 12-21-2007 have been fully considered but they are not persuasive. Applicant's arguments appear to rely primarily on the assertion that Austin does not teach the use of a constricted region substantially smaller than the radius of gyration. The examiner would agree with this (see the allowed claims above and the discussion at the end of the modified 102 rejection), but claims 39-55 do not require this. Independent claims 39 and 44 merely require a constricted region that is substantially less than the equilibrium spherical shape and claims 51 and 53 merely require the presence of an entropic barrier. Both of these limitations are still met by the teaching of Austin. Applicant also urges that Austin does not teach alternating constricted and unconstricted regions. This is also incorrect as can be seen in fig. 3, 4, and 6 where a constricted region is followed by a short unconstricted region, which is then followed by another constricted region. Applicant further urges that Austin does not teach the use of an entropic barrier. However as discussed above, the use of a dimension of S_d that is one-half the diameter of the molecules being passed through clearly constitutes an entropic barrier as defined by the claims.

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11. Applicant's arguments concerning the 103 rejection appear to rely on applicant's perceived failings of the earlier 102 rejection. Because these earlier arguments were not persuasive as discussed above, these arguments against the 103 rejection are similarly unpersuasive.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAJ K. OLSEN whose telephone number is (571)272-1344. The examiner can normally be reached on M-F 8:00-4:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kaj K Olsen/
Primary Examiner, Art Unit 1795
March 20, 2008